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RESEARCH AND DEVELOPMENT

Contract No. N00014-88-C-0571

"A Cryocooler for High Acceleration Applications"

Tenth Quarterly Report

for period

December 15, 1990 through March 14, 1991

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On February 26, 1991 we received delivery of the long-delayed heat exchanger material. In addition, a no cost extension to run through September 14, 1991 has been approved.

A schedule for completing the test program has been developed and is shown below. Much of the effort will be devoted to understanding the details that affect the bonding process. There are two main bonding methods we will study. The first uses a glass frit - a mixture of fine glass particles and binder. The frit is applied to the spacers, the binder burned off, the plates and spacers assembled together and then the assembly is fired to melt the glass and fuse the assembly together. The second approach is very similar to the first, except that a braze alloy is used instead of a glass frit. Each process has different pros and cons. The glass frit does not have the bond strength that the braze alloy does. It does however stay in place during the fusing process. Molten braze can flow over the entire plate surface and this can lead to plugging of the flow passages. Additional processing steps are necessary to prevent this from happening. Based on results of these studies, a bonding method will be selected and test heat exchangers fabricated.

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